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| 09/857,348                | 07/24/2001  | Fredrik Persson      | 66477-012-5         | 3135             |
| 26694                     | 7590        | 01/11/2006           | EXAMINER            |                  |
| VENABLE LLP               |             |                      | MACARTHUR, VICTOR L |                  |
| P.O. BOX 34385            |             |                      | ART UNIT            |                  |
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3679

DATE MAILED: 01/11/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/857,348

Applicant(s)

PERSSON ET AL

Examiner

Victor MacArthur

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 01 November 2005.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 21-37 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 21-37 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 June 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
 Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
 Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Priority***

Acknowledgment is made of applicant's claim for foreign priority based on an application filed in Sweden on 12/03/1998. It is noted, however, that a copy of a certified copy of the priority document has not been received.

### ***Specification***

The Specification is objected to since pg.3, l.30 appears to be a literal translation in need of correction; i.e., how does one “secure” friction?

### ***Drawings***

Figure 5 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g).

The drawings are objected to under 37 CFR 1.84(h)(5) because Figure 4 shows modified forms of construction in the same view. See 37 CFR 1.121(d).

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the following limitations must be shown or canceled from the claims:

- “movable element” (line 1 of claim 21, line 2 of claim 29)
- “fixed element” (line 2 of claim 21, line 2 of claim 29)
- “three driving means” (line 3 of claim 21, line 4 of claim 29)
- “link device” (line 4 of claim 21)
- “distal half of each joint ball” (line 11 of claim 21, lines 12-13 of claim 29)

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- “proximal half of each joint ball” (line 12 of claim 21, line 13 of claim 29)
- “the grooves engaging and deforming the side surface” (lines 14-15 of claim 21 and line 15 of claim 29)
- “the grooves penetrate and permanently deform the bearing member” (lines 1-2 of claims 26 and 35)

No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement-drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Objections***

Claim 21 is objected to because of the following informalities:

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- The limitation “each driving one link device” (line 4 of claim 21) should be replaced with --each rod driving one link device-- to improve claim clarity.

Appropriate correction is required. For purposes of examining the instant invention, the examiner has assumed these corrections have been made.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 21-28 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Line 2 of claim 21 recites “three driving means”.

Applicant has not pointed out where the amended claim is supported, nor does there appear to be a written description of the claim limitation “three driving means” in the application as filed such that this limitation constitutes new matter. Claim 29 also contains this limitation in line 4 and is thus similarly rejected. All remaining claims ultimately depend from either claim 21 or claim 29.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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Claims 21-28 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Lines 1-2 of the preamble of claim 21 recites "An industrial robot operative to position a movable element in relation to a fixed element" such that the "movable element" and "fixed element" are not positively recited but are merely set forth as an intended use of the "robot". Positive recitations of the "fixed element" and "movable element" elsewhere in the claim (lines 4-5) thus render the scope unclear. Are the claims positively reciting fixed and movable elements or are these elements purely an intended use for the robot? For purposes of examination, the examiner has considered claim 8 without combination. Claims 22-28 depend from claim 21 and are thus similarly rejected.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 21-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Clavel U.S. Patent 4976582 in view of Latzen U.S. Patent 2733085 and Matsuoka (U.S. Patent 4,430,016).

Claim 21. Clavel discloses (fig.2) an industrial robot operative to position a movable element in relation to a fixed element, comprising: three driving means (4, 5) each comprising rods (4) arranged in multi-joint systems including three-axle ball and socket joints (26a, 26b,

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27a, 27b as described in col.3, ll.43-45) and each rod driving one link (or linkage) device (5a, 5b) arranged between the fixed element and the movable element. Clavel does not expressly state the specific details of the ball and socket joint. Latzen teaches (fig.1) that it is desirable for ball and socket joints to have the following details: each joint comprising a joint ball (1) and a joint socket (2, 7), the joint socket enclosing the joint ball with a space that comprises approximately one-half the ball or less, the joint socket further comprising a housing (2) and at least one removable annular bearing (7) member arranged in the housing, the bearing member comprising a bearing surface engaging at least a portion of a distal half (left half) of each joint ball and at least a portion of a proximal half (right half) of each joint ball, the housing comprising a surface (surface of 2 contacting 15) against which a side surface of the at least one bearing member abuts, the surface comprising a plurality of friction-increasing grooves (grooves in 2 receiving 15) extending in a longitudinal direction of the surface, the grooves engaging and **deforming** (in as much as the applicant's finished product does) the side surface of the at least one bearing member and being operative to increase friction between the at least one bearing member and the housing to rotationally immobilize the at least one bearing member in the housing during operation of the driving means (emphasis added). Latzen states that such specific details are desirable for improving tolerances and lubricating conditions (col.1, ll.23-25). Neither Clavel nor Latzen expressly state what material the bearing should be made of. Matsuoka teaches (figs.1 and 3) that it is desirable to make bearings (4) from a polymeric material for the purpose of improving lubrication (col.3, ll.13-17). Therefore, it would have been obvious to one with ordinary skill in the art at the time the invention was made to use ball and socket joints, with details taught by Latzen and Matsuoka, for the ball and socket joints of Clavel, since such details

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are desirable for improving tolerances and lubricating conditions. Regarding the limitation “deforming”, it appears that the applicant’s fully assembled robot joint does not incur any deformation in the bearing element after assembly since deformation requires active movement and the applicants side surface is static with respect to the grooves. It is only during assembly when the bearing is inserted into the housing that any deformation occurs. As such, this limitation describes a method of forming. Since claim 1 is a product claim the specific method of forming is not germane to the issue of patentability of the device itself. Therefore, the limitation “deforming” has been given only limited patentable weight. See MPEP § 2113.

Claim 22. Latzen further teaches the specific detail of the joint socket enclosing at least a portion of the distal (left) half of the joint ball and at least a portion of the proximal (right) half of each joint ball. It would have been obvious to include this additional detail by the same reasoning stated in the rejection of claim 21 above.

Claim 23. Latzen further teaches the specific detail of the grooves being aligned at an angle (zero degrees such that the grooves are parallel to the longitudinal axis) with respect to a longitudinal axis of the bearing member. Note that the preferred embodiment of the applicant’s invention also comprises an angle of zero degrees such that the grooves are parallel with the longitudinal axis (Specification, p.3, ll.27-30). It would have been obvious to include this additional detail by the same reasoning stated in the rejection of claim 21 above.

Claim 24. Latzen further teaches the specific detail of the grooves including pointed tops (as seen in fig.1). It would have been obvious to include this additional detail by the same reasoning stated in the rejection of claim 21 above.



Claim 25. Latzen further teaches the specific detail of the at least one bearing member comprising a plurality of grooves (15) extending in a longitudinal direction of the side surface and compatible with the grooves in the housing. It would have been obvious to include this additional detail by the same reasoning stated in the rejection of claim 21 above.

Claim 26. Latzen further teaches the specific detail of the grooves penetrating with the bearing member being permanently deformed (into its final product shape). It would have been obvious to include this additional detail by the same reasoning stated in the rejection of claim 21 above. The limitation “permanently deform” describes a method of forming as stated in the rejection of claim 21 above. The method of forming is not germane to the issue of patentability of the device itself. Therefore, the limitation “permanently deform” has been given only limited patentable weight. See MPEP § 2113.

Claim 27. Latzen further teaches the specific detail of the housing and the bearing member each having a socket shape, wherein a spring force (contact force) holds the ball and socket joint together (in as much as the applicant’s invention does) and fixes the bearing member in place. It would have been obvious to include this additional detail by the same reasoning stated in the rejection of claim 21 above.

Claim 28. Latzen further teaches the specific detail of the at least one bearing member being pressed to fit tightly in the housing (in as much as the applicant’s invention is).

Claim 29. Clavel as modified by Latzen and Matsuoka in the rejection to claim 21 above discloses all of the method steps required to make the joint of claim 29 with the exception of the method step of “the grooves [of the housing] engage the side surface of the at least one bearing member”. Rather Latzen teaches the opposite: grooves (15) on the bearing element engaging

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the housing (2) to deform the housing (as seen in fig.1). However, the reversal of components in a prior art reference is a design consideration within the skill of the art. In re Gazda, 219 F.2d 449, 104 USPQ 400 (CCPA 1955); In re Japikse, 181 F.2d 1019, 86 USPQ 70 (CCPA 1950). Furthermore, such reversal would better allow for replacement of a worn bearings since each new bearing would be deformed to fit the housing exactly. Therefore, it would have been obvious to reverse the positioning such that grooves are located in the housing such that they engage the bearing element to deform the bearing element; since such practice better allows for replacement of bearings and is a design consideration within the skill of the art.

Claim 30. The above modification fixes a location of the bearing member in the robot (in that it is not free to move after installation).

Claim 31. Latzen further teaches the specific detail of the joint socket enclosing at least a portion of the distal (left) half of the joint ball and at least a portion of the proximal (right) half of each joint ball. It would have been obvious to include this additional detail by the same reasoning stated in the rejection of claim 21 above.

Claim 32. Latzen further teaches the specific detail of the grooves being aligned at an angle (zero degrees such that the grooves are parallel to the longitudinal axis) with respect to a longitudinal axis of the bearing member. Note that the preferred embodiment of the applicant's invention also comprises an angle of zero degrees such that the grooves are parallel with the longitudinal axis (Specification, p.3, ll.27-30). It would have been obvious to include this additional detail by the same reasoning stated in the rejection of claim 21 above.

Claim 33. Latzen further teaches the specific detail of the grooves including pointed tops (as seen in fig. 1). It would have been obvious to include this additional detail by the same reasoning stated in the rejection of claim 21 above.

Claim 34. Latzen further teaches the specific detail of the at least one bearing member comprising a plurality of grooves (15) extending in a longitudinal direction of the side surface and compatible with the grooves in the housing. It would have been obvious to include this additional detail by the same reasoning stated in the rejection of claim 21 above.

Claim 35. The modification for reversal of parts as detailed in claim 29 suggests that the grooves penetrate with the bearing member being permanently deformed (into its final product shape).

Claim 36. Latzen further teaches the specific detail of the housing and the bearing member each having a socket shape, wherein a spring force (contact force) holds the ball and socket joint together (in as much as the applicant's invention does) and fixes the bearing member in place. It would have been obvious to include this additional detail by the same reasoning stated in the rejection of claim 21 above.

Claim 37. Latzen further teaches the specific detail of the at least one bearing member being pressed to fit tightly in the housing (in as much as the applicant's invention is).

### ***Response to Arguments***

Applicant's arguments with regard to the claim rejections have been fully considered but they are not persuasive.

The applicant argues that the drawings show the bearing member installed in the socket which in and of itself is enough to satisfy a showing of the grooves engaging and deforming the bearing member. This is not persuasive. It is not necessary for a bearing member that is being installed in a socket to be so installed through deformation. The applicant's drawings do not depict any process of deformation nor do they depict any final product structure unobtainable from a non-deforming assembly procedure (i.e. a bearing member preformed to fit grooves). Moreover, given the extreme informal nature of the drawing, it is not even clear what is being illustrated or if what is illustrated is accurate.

The applicant argues that Latzen does not teach a bearing member that engages a portion of a distal half of the joint ball not adjacent the rod the ball is connected to. This is not persuasive. Since the limitation "not adjacent the rod the ball is connected to" is not recited in the claims. Latzen teaches a bearing member engaging a portion of a distal half (right half) of the joint ball as detailed in the prior art rejections above. Furthermore, note that if the claims were to be amended to define the distal and proximal halves as being opposite and adjacent from the rod, respectively, then the applicant's own invention would not engage "at least a portion of a distal half of each joint ball and at least a portion of a proximal half" as currently claimed (see applicant's figure 4 which clearly shows the bearing contacting only 1 half of the ball).

The applicant argues that the Latzen socket surrounds more than about one-half of the ball. This is not persuasive since no negative limitation is recited in the claims forbidding surrounding more than one-half of the ball. Rather, the limitation "the joint socket enclosing the joint ball with a space that **COMPRISES** approximately one-half the ball or less" makes no mention of what the space does not comprise or include (emphasis added). Furthermore, if the

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claims were amended to state that --the joint socket encloses no more than one-half the ball--, Latzen would still apply since figure 1 of Latzen shows a socket (8, 7) that encloses no more than one-half the ball (1). The applicant's presumption that the Latzen invention, when actually constructed, differs from that which is shown in the Latzen drawings is irrelevant to the question of whether or not the Latzen drawings read on the applicant's claims. Drawings and pictures anticipate claims if they show the structure which is claimed. The origin of a drawing used as prior art is immaterial and it does not matter that the feature shown is unintended or unexplained. *In re Aslanian*, 590 F.2d 911, 200 USPQ 500 (CCPA 1979). See MPEP § 2125.

The applicant argues that Latzen and Clavel are not bodily incorporable. This is not persuasive. The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981).

The applicant argues that the prior art does not disclose the applicant's "quick changing of the bearing member" or "quick stroke time". This is not persuasive since these limitations are not recited in the claims. Furthermore, the limitation "quick" is relative such that if the claims were to be so amended the prior art of record would still apply within the broadest reasonable interpretation.

***Conclusion***

Applicant's amendment (i.e., the newly added limitation "three driving means" in line 2 of claim 21) necessitated the new ground(s) of rejection presented in this Office action.

Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Victor MacArthur whose telephone number is (571) 272-7085. The examiner can normally be reached on 8:30am - 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Daniel P. Stodola can be reached on (571) 272-7087. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571) 272-3600.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197.

*VLM*

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December 30, 2005

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